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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/580,861	05/30/2000	Giridhar D. Mandyam	NC17137	1169

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EXAMINER	
ODOM, CURTIS B	

ART UNIT	PAPER NUMBER
2634	7

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/580,861	Applicant(s) MANDYAM, GIRIDHAR D.	
	Examiner Curtis B. Odom	Art Unit 2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 May 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-4, 11-17, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sunwoo et al. (previously cited in Office Action 12/15/03) in view of Nysen (U. S. Patent No. 4, 623, 890).

Regarding claim 1, Sunwoo et al. discloses in a radio device operable in a radio communication system at least to receive a receive signal, the receive signal formed of a desired component transmitted (column 1, lines 15-20, spread spectrum signal is the desired component) to the radio device upon a desire receive band and at least potentially a non-desired signal component (column 2 lines 11-17, noise is the non-desired signal component) transmitted to the radio device upon an other-than-desired receive band, wherein the noise is from an adjacent band, an improvement of apparatus for facilitating the recovery of the desired component of the receive signal, the apparatus (Fig. 1) comprising:

a desired component indicia detector (Fig. 1, block 14, column 1, lines 49-57) coupled to receive indications of the receive signal that contains the desired component and at least potentially the non-desired component, the non-desired component indicia

detector for detecting an indicia of the desired component of the receive signal, wherein m(k) contains the desired component and at least potentially the non-desired component;

a receive signal sampler (Fig. 1, block 15, column 1, lines 49-57) also coupled to receive indications of the receive signal and coupled to receive the detection signal formed by the non-desired component indicia detector responsive to the indications of the indicia of the desired component of the receive signal detected by the desired component indicia detector, the receive signal sampler for sampling the receive signal at sampling times responsive to the indicia detected by the desired component indicia detector, the receive signal once sampled, representative of the receive signal, wherein s(n) is a signal representative of the receive signal.

Sunwoo et al. does not disclose the desired component indicia detector can be implemented as a non-desired component indicia detector, the non-desired component indicia detector for detecting an indicia of the non-desired component of the receive signal and for forming a detection signal indicative of the non-desired component, free of indications of the desired component, wherein the sampler forms a sampled signal free of the non-desired component through appropriate selection of sampling times based on the detection signal.

However, Nysen discloses a receiver (Fig. 6, column 5, line 50-column 6, line 42) comprising of a non-desired component indicia detector (Fig. 6, block 126), the non-desired component indicia detector for detecting an indicia of the non-desired component (non-linearity or difference frequencies) of a signal and for forming a detection signal indicative (column 6, lines 36-42) of the non-desired component, free of indications of the desired component (wherein the low pass filter only passes the only non-linearity or

non-desired component to the detector as disclosed); and a sampler forming a sampled signal through appropriate selection of sampling times based on the detection signal (column 6, lines 36-42).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device of Sunwoo et al. with the filter and detector of Nysen in order to control the sampler. The non-desired component indicia detector of Nysen produces a detection signal, free of indications of the desired component, which would control the sampler to produce a sampled signal in which the non-linearity of the signal is compensated for based on the detection signal (Nysen, column 6, lines 18-29).

Regarding claim 2, which inherits the limitations of claim 1, Nysen further discloses the non-desired component (difference frequencies) of the signal exhibits a characteristic frequency, represented by a waveform having power-level zero-crossings, and wherein the indicia detected by the non-desired component indicia detector comprises indications of occurrences of the zero-crossings of the non-desired component of the zero-crossings (column 6, lines 36-42), wherein the difference frequencies or non-linearity is the non-desired component.

Regarding claim 3, which inherits the limitations of claim 2, Nysen further discloses the non-desired component detector comprises a zero-crossing detector (Fig. 6, block 126), the zero-crossing detector for detecting times at which the non-desired component of the receive signal crosses a zero power level and for forming signal crossing indications responsive thereto (column 6, lines 36-42).

Regarding claim 4, which inherits the limitations of claim 3, Nysen further discloses a filter element (Fig. 6, block 124, column 6, lines 36-42) positioned in line

with the zero-crossing detector, the filter element for forming a filtered signal, the filtered signal forming the indications of the signal to which the zero-crossing detector is coupled to receive.

Regarding claim 11, which inherits the limitations of claim 1, Sunwoo et al. further discloses the desired component of the receive signal comprises a transmit signal intended to be transmitted to the radio device (column 1, lines 15-20), wherein the spread spectrum signal is the transmit signal, and wherein the non-desired component (column 2, lines 11-17) comprises and adjacent channel identifying signal, wherein noise is the non-desired component and can be caused by adjacent channels since CDMA is used for transmission.

Regarding claim 12, which inherits the limitations of claim 11, Sunwoo et al. discloses the radio communication system comprises CDMA cellular communication system (column 1, lines 15-35), wherein the desired receive band comprises a CDMA receive band allocated to the CDMA cellular communication system for communication thereon of CDMA signals (column 1, lines 53-55), wherein DS/CDMA comprise of cellular systems.

Regarding claim 13, which inherits the limitations of claim 12, Sunwoo et al. further discloses the radio device comprises a cellular mobile terminal (column 1, lines 20-31) having a transmit and receive portion (column 1, lines 7-13), and wherein the non-desired component indicia detector and the receive signal sampler comprise portions of the receive portion of the cellular mobile terminal (column 1, lines 41-54).

Regarding claim 14, Sunwoo et al. discloses a method for communication by way of radio device operable in a radio communication system at least to receive a receive

signal, the receive signal formed of a desired component transmitted (column 1, lines 15-20, spread spectrum signal is the desired component) to the radio device upon a desire receive band and at least potentially a non-desired signal component (column 2 lines 11-17, noise is the non-desired signal component) transmitted to the radio device upon an other-than-desired receive band, wherein the noise is from an adjacent band, an improvement of method for facilitating the recovery of the desired component of the receive signal, the method comprising:

receiving (Fig. 1) at the radio device a receive signal that contains both the desired component and at least potentially the non-desired component;

detecting (Fig. 1, block 14, column 1, lines 49-57) at the radio device an indicia of the desired component of the receive signal received at the radio device, wherein m(k) contains the desired component and at least potentially the non-desired component;

sampling (Fig. 1, block 15, column 1, lines 49-57) at sampling times responsive to the indicia detected by the desired component indicia detector during the operation of detecting, the sampling times selected to correspond to times at which a component of the received signal is of zero power level magnitudes; and

forming (Fig. 1, block 15, column 1, lines 49-57) a sampled signal responsive to the sampling performed during the operation of sampling, the sampled signal representative of the desired component.

Sunwoo et al. does not disclose the desired component indicia detection can be implemented as a non-desired component indicia detectopm, the non-desired component indicia detection for detecting an indicia of the non-desired component of the receive signal and for forming a detection signal indicative of the non-desired component, free of

indications of the desired component, wherein the sampling forms a sampled signal free of the non-desired component through appropriate selection of sampling times based on times at which the non-desired component of the receive signal is of zero power level magnitudes.

However, Nysen discloses a receiver (Fig. 6, column 5, line 50-column 6, line 42) comprising of a non-desired component indicia detection (Fig. 6, block 126), the non-desired component indicia detection for detecting an indicia of the non-desired component (non-linearity or difference frequencies) of a signal and for forming a detection signal indicative (column 6, lines 36-42) of the non-desired component, free of indications of the desired component (wherein the low pass filter only passes the only non-linearity or non-desired component to the detector as disclosed); and s sampling operation forming a sampled signal through appropriate selection of sampling times based on times at which the non-desired component of the receive signal is of zero power level magnitudes.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device of Sunwoo et al. with the teachings of the filter and detection of Nysen in order to control the sampler. The non-desired component indicia detector of Nysen produces a detection signal, free of indications of the desired component, which would control the sampling to produce a sampled signal in which the non-linearity of the signal is compensated for based on the detection signal (Nysen, column 6, lines 18-29).

Regarding claims 15 and 16, which inherit the limitations of claim 14 the claimed method includes features that correspond with subject matter mentioned above in the rejection of claims 2, and 4 which in applicable hereto.

Regarding claim 17, which inherits the limitations of claim 17, Nysen further discloses a signal is sampled during the operation of sampling at times corresponding to occurrences of power-level zero crossings detected during the operation of detecting (column 6, lines 36-42).

Regarding claim 20, the claimed method includes features that correspond with subject matter mentioned above in the rejection of claim 1 are applicable hereto.

4. Claims 5-10, 18, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sunwoo et al. (previously cited in Office Action 12/15/03) in view of Nysen (U.S. Patent No. 4, 623, 890) and in further view of Tateishi (previously cited in Office Action 12/15/03).

Regarding claims 5 and 6, Sunwoo et al. and Nysen. disclose all the limitations of claim 5 and 6 (see previous rejection of claim 4), except a digitizer in line with the filter element and coupled to receive representations of the receive signal, the digitizer for digitizing the representations of the receive signal, the digitized representations applied to the filter element wherein the indications of the receive signal of which the receive signal sampler is coupled to receive comprise the digitized representations of the receive signal.

However, Tateishi discloses a digitizer (Fig. 4, block 5, column 4, lines 6-10) to receive representations of the receive signal, and digitizing the representations of the receive signal, the digitized representations applied to a zero crossing detector (Fig. 4, block 31, column 4, lines 34-37). Therefore, it would have been obvious to one of

ordinary skill in the art at the time the invention was made to modify the receiver of Sunwoo et al. and Nysen to include the digitizer of Tateishi to allow the filtering, zero-crossing detection and sampling to be performed in the digital domain which would allow for consistent signal quality and resistance to noise and interference in the receiver which could damage the signal during processing.

Regarding claim 7, which inherit the limitations of claim 6, Sunwoo et al., Nysen and Tateishi do not disclose a delay element positioned between the digitizer and the receive signal sampler, the delay element for delaying application of the digitized representation of the receive signal to the receive signal sampler for a selected time period. However, it would have been obvious to one skilled in the art at the time the invention was made to include this feature to have the signal arrive at the sampler at the same time as the indications from the detector in order to properly sample the signal using the zero-detection readings. Sampling with the indications would produce a more accurate information signal with reduced noise.

Regarding claim 8, which inherits the limitations of claim 7, Sunwoo et al., Nysen and Tateishi do not disclose the delay element delays the digitized representation of the receive signal substantially corresponds to a time period required by the filter element to form the filtered signal. However, it would have been obvious to one skilled in the art at the time the invention was made to include this feature to have the signal arrive at the sampler at the same time as the indications from the detector in order to properly sample the signal using the zero-detection readings. Sampling with the indications would produce a more accurate information signal with reduced noise.

Regarding claim 9, which inherits the limitations of claim 5, Tateishi further discloses a clock signal generator (Fig. 4, block 9, column 4, lines 6-9) coupled to the digitizer, the clock signal generator for generating a clock signal of a clock rate responsive to which the digitizer digitizes the representation of the receive signal. It would have been obvious to one of ordinary skill in the art to include this feature because controlling the sampling frequency allows one to obtain the most accurate representation of the digital signal.

Regarding claim 10, which inherits the limitations of claim 9, Tateishi does not disclose the clock rate of the clock signal generated by the clock signal generator is greater that the characteristic frequency of the non-desired signal component of the receive signal. It would have been obvious to one of ordinary skill in the art to include this feature to reduce the noise in the digital representation of the signal.

Regarding claims 18 and 19, the claimed method includes features that correspond with subject matter mentioned above in the rejection of claim 5 and 10 are applicable hereto.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Curtis B. Odom whose telephone number is 703-305-4097. The examiner can normally be reached on Monday- Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 703-305-4714. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Curtis Odom
June 9, 2004

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